strength. It has yet to be developed and used as effectively as it might. First it must be recognized for the force that it is by the profession and its leadership at all levels. The time is later than many might think.

—MSMW

Discontinuation of Routine Smallpox Vaccination

NOW THAT THE UNITED STATES has been free of smallpox for 28 years, serious concern has been felt about the morbidity and mortality which has resulted from vaccination itself. In recent years there has been an average of seven deaths annually and numerous severe sequelae. A great many of these complications are avoidable, but they have raised the question of whether universal or routine vaccination is worth this risk.

This comes at a time when mass efforts for immunization, spurred by the World Health Organization, have resulted in near elimination of the disease in areas where constantly recurring epidemics have prevailed. According to the morbidity and mortality report for January 22, 1972, from the Center for Disease Control, U.S. Public Health Services (HEW), smallpox occurred in 42 countries in 1967, in 23 countries in 1970 and in 17 in 1971. During the last six months smallpox was reported from only four countries—India, Pakistan, Ethiopia and Sudan. Mexico has been free of variola since 1955 and Brazil has escaped for the past two years.

After several years of spirited debate the recommendations of the U.S. Public Health Service, the California State Department of Health, and the Committee on Infectious Diseases of the Academy of Pediatrics now state that vaccination in infancy or before school attendance should be abandoned as a routine and should be restricted only to those for whom there is significant risk of exposure—that is, those in the Armed Services, others who plan to travel in endemic areas, and physicians, nurses, hospital attendants and other health personnel in the United States who are at the greatest risk of exposure to the possible imported case. In England and Europe, half the cases contracted from exposure to those of foreign origin occurred in hospital personnel.

Primary vaccination could be expected to occur in adults who have not been previously vaccinated. It is now believed that primary vaccination of adults will not result in increased frequency of sequelae; formerly, it was accepted that the contrary was the case. The unexplained horrendous incidence of complications in military recruits in the Netherlands may be recalled.

Modern transportation has increased the threat of importing cases. It is necessary only for an unimmunized person to have been intimately exposed 14 days before arrival in the United States to be responsible for infection of contacts. So far, this has not been a problem. However, in Britain, 13 imported cases occurred between 1951 and 1970, followed by 103 secondary cases and 37 deaths. During this same period, however, there were 100 deaths from smallpox vaccination. (The figures for this statement were supplied by Dr. C. Henry Kempe, probably the best authority on smallpox in the United States.) Prompt recognition of the imported disease would make it possible to vaccinate all contacts; the use of the drug methisazone (Marboran®) may make it possible to control spread even further.

This disease is stated to be less infectious than influenza and measles, although this is contrary to what most of us previously believed. It must be borne in mind that the smallpox scab can transmit the disease after two years if kept dry and at room temperature, unlike the scab of vaccinia or chickenpox, which loses virulence quickly.

In spite of so-called compulsory vaccination, the prevailing level of immunity in the United States is so low that vaccination cannot be credited with the eradication of smallpox. It must be remembered, however, that practically every important pathogen has had an inexplicable wax and wane in occurrence and severity: staphylococci, meningococci, B. pestis, C. diphtheriae, influenzae virus, etc. The present weight of evidence seems to support the discontinuation of vaccination as a routine procedure. However, no matter how reasonable and acceptable this may appear *(which it does)* it poses a number of problems which must be faced by the physician:

1. Smallpox vaccination has been an almost

sacred institution in the public mind and credited with the "conquest" of variola in the United States. However, public reeducation, "dis-education," is a hazardous matter. The "anti's" of all persuasions will be filled with glee and will assert that vaccination has not been responsible for the decrease of this disease in this country at all. In these days, when oversimplification characterizes the news media dissemination of scientific information, this may lead to distrust regarding other forms of immunization which have also been authoritatively proposed as a necessity. It may lead to such questions as is there a communication gap or, worse, a conflict of interest? This might prove to be a threat to other immunizations which are so well established and beneficial.

2. We grant that routine vaccination should be continued for all health and hospital personnel. At this moment, a crash program for these persons is proposed, but it should not be forgotten that pediatric wards will be filled with unvaccinated children who will be at significant risk of contact with those with primary vaccination takes. Children under treatment with steroids or those with eczema or malignant disease, or with immune deficiencies (which group make up a large proportion of children in today's pediatric ward) will be at risk of exposure to these attendants. Eczema vaccinatum, often fatal, usually results from exposure of an eczematous child to a recently vaccinated contact. Health personnel probably should be vaccinated during vacations and not permitted to expose today's hospital patients who are especially vulnerable, including some adults and many children. This precaution has been largely ignored in the past.

3. Routine vaccination must be continued for those in the Armed Forces. A great many of the present recruits have been vaccinated in early childhood; for them, revaccination is a relatively benign procedure. In the future, primary vaccination in recruits will constitute a new hazard of severe reactions and late sequelae at a time when they are subjected to a number of other immunizations.

It has been proposed that attenuated or killed vaccine may be employed for these as a preliminary measure, but this product is not yet available, and will be hard to come by.

4. If a patient has imported smallpox, who will be responsible for the diagnosis? Most of today's physicians have not seen a single case; it is possible that suspicion of the diagnosis might be long deferred and permit the number of contacts to become extensive. A few years ago near-panic was set off by a misdiagnosed patient who was finally discovered to have chickenpox. More than 25 years ago, in the last imported case (in San Francisco from Asia) the patient died, shortly after arrival, with the diagnosis of purpura hemorrhagica. The final diagnosis was established only after several deaths among several doctors, nurses, the undertaker and other contacts in whom smallpox had developed.

5. Some physicians have asked whether a child who has now been vaccinated at the age of one year should be revaccinated on reaching school age in order to have his immunity prolonged. This is probably not a matter of great importance with this new recommendation for, once having a primary take, the child will have limited vulnerability to exposure and almost no risk of fatal smallpox.

The abandonment of smallpox vaccination will thus not put an end to all existing questions about this disease and immunization for it. Previously, vaccination was compulsory by legislation. The present statements from various authorities are simply recommendations to abandon compulsory vaccination. It will permit the physician to follow his personal judgment in a variety of situations but may make his defense difficult if unpleasant sequelae follow vaccination without any special indications.

EDWARD B. SHAW, M.D.
Department of Pediatrics
University of California, San Francisco

Multidisciplinary Teamwork In the Management of Childhood Cancer

THE ARTICLE IN THIS ISSUE by Finklestein and Gilchrist, "Recent Advances in Neuroblastoma," illustrates repeatedly the importance of new dimensions of multidisciplinary teamwork in the management of cancer.